

CASE REPORT

Reattachment of Anterior Teeth Fragments on a Pluri Traumatized Teeth

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ABSTRACT

Tooth fragment reattachment is a conservative esthetic and a cost-effective restoration option that has been shown to be an acceptable alternative approach to the restoration of the fractured tooth with resin-based composite. This approach can provide good and long-lasting esthetics that can restore the function and result in a positive psychological response in patients and it is also reasonably a simple procedure.

Reattachment of the fractured fragment is currently the preferred technique but patient cooperation and understanding of the limitations of the treatment is of utmost importance for good prognosis. This case report presents a complicated crown fracture of anterior teeth requiring endodontic therapy, followed by the reattachment of the fractured fragment with fiber post was performed.

Keywords: Crown fractures, Fiber post, Permanent teeth, Reattachment.

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INTRODUCTION

Coronal fractures of anterior teeth are common form of dental trauma that mainly affects patient both socially and psychologically. It usually affects only a single tooth; however, certain trauma types, such as falls, contact sports, automobile accidents, or foreign bodies striking the teeth can involve multiple tooth injuries.¹ Patients with trauma are in pain and need emergency treatment during their first dental visit. In such situations patients are quite apprehensive because of impaired functions,

esthetics, and phonetics. While handling such cases it is important to successfully manage the pain with immediate restoration of function, esthetics, and phonetics.²

Pin retained resin, orthodontic bands, stainless steel crowns, porcelain jacket crowns, and complex ceramic restorations are the various methods and techniques which are used to restore fractured teeth.^{3,4} These treatment modalities cannot be used in an emergency esthetic situation because they require significant tooth preparation and were not esthetically adequate.⁵

Reattachment of the tooth fragment is one of the treatment options in managing the fractured tooth which will provide good and long-lasting esthetics. Reattachment of fractured fragment has become possible due to the developments and improvement in adhesive techniques and restorative materials.⁶ This case report presents a complicated crown fracture of anterior teeth requiring endodontic therapy, followed by the reattachment of the fractured fragment with fiber post was performed.

CASE REPORT

A 25-year-old male patient was referred to the Conservative Dentistry and Endodontics clinic, Manipal College of Dental Sciences, Manipal University, Mangaluru, Karnataka, India, with a chief complaint of broken upper front teeth occurred due to a motorcycle accident.

Clinical examination revealed fracture in the cervical third region of 11, 21, and 12 with pulp exposure (Fig. 1). The fractured fragment was loosely attached in both the central incisors; the fracture line extends palatally till the equigingival level. But the crown of lateral incisor was completely dislodged and the tooth fragment was not recovered. Soft tissue examination showed laceration of the upper lip.

Radiographic examination revealed oblique fracture labiopalatally with no extrusion of the tooth (Fig. 2). The root development was complete, closed apices, no periapical pathology, and absence of root or alveolar bone fractures. Patient was very apprehensive about his fractured tooth. He was assured and the various treatment options were explained to the patient, so he preferred to retain the fractured fragments. The patient was provided with detailed explanation about the treatment plan and an informed consent was taken.

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Fig. 1: Fracture in the cervical third region of 11, 21, and 12 with pulp exposure

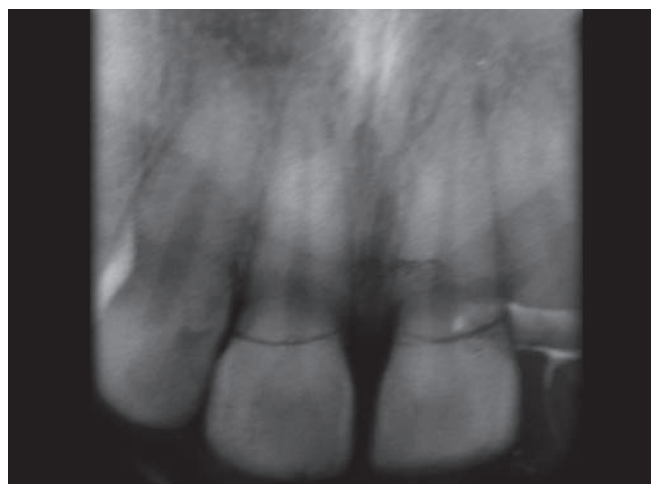


Fig. 2: Intraoral periapical showing oblique fracture labiopalatally

A local anesthetic was administered and the teeth fragments of 11 and 12 were removed and immersed in physiological saline solution to avoid dehydration during clinical, radiographic evaluation, and endodontic therapy (Fig. 3). Gingivectomy was done to gain better access on the palatal fracture line and to verify that the fracture did not extend apically; the fit of the fragment was checked (Fig. 4). Access opening was done with respect to 11, 12, and 21 and the working lengths were determined followed by biomechanical preparation was done using Protaper NiTi rotary instruments. The instruments were used according to the manufacturer's instructions in the sequence $S_x, S_1, S_2, F_1, F_2,$ and F_3 in crown down technique with alternate irrigation with 2.5% sodium hypochlorite and saline solution. The root canals were dried with paper points and obturated using Protaper gutta-percha points (Dentsply Maillefer, Ballaigues, Switzerland) and AH plus sealer (Maillefer, Dentsply, Konstanz, Germany) by lateral compaction.

Then post space preparation was done by removing the gutta percha from the coronal two-thirds of the canal with peeso reamers drill (size 3). Internal grooves are placed in the teeth 11, 21, and the fractured fragment, in order to enhance the retention. The fiber post (Reforpost, Angelus, Londrina, PR, Brazil) was tried in the canal and adjusted to the desired length. The post was then luted to the canal using a self-adhesive resin cement (Relyx U200, 3M ESPE) with respect to 11, 21, and 12 (Fig. 5). Teeth and the coronal fragments of 11 and 21 were etched and bonded to the tooth using Flowable composite (Filtek™ Supreme Ultra, 3M ESPE) after proper shade matching. Then the right lateral incisor (12) was etched, bonded, and coronal buildup was done using microhybrid composite (Filtek™ Z250, 3M ESPE), followed by porcelain fused to metal crown was placed. The margins were properly finished with diamond burs and polished with a series of Sof-Lex disks (3M ESPE) (Fig. 6). Final evaluation for occlusion and esthetics was done. Postoperative



Fig. 3: Immersed in physiological saline solution



Fig. 4: Gingivectomy done to gain better access on the palatal fracture line



Fig. 5: Post luted to the canal using a self-adhesive resin cement



Fig. 6: Properly finished margins

instruction regarding preventing loading of the anterior teeth was given to the patient. Periodic recall was done after 1, 3, 6 months, and 1 year after the trauma; the patient showed no periodontal or periapical pathology. The teeth were found to be functional and esthetically acceptable.

DISCUSSION

The remarkable advancement in adhesive systems and resin composites has made reattachment of tooth fragments a procedure, i.e., no longer a provisional restoration but rather a restorative treatment offering a favorable prognosis.^{7,8} Reattachment of the fractured fragment after endodontic treatment followed by fiber post placement was possible in the present case as the fragment was intact. The advantages of tooth fragment reattachment over conventional composite restoration are most rapid and conservative management, better esthetics, incisal edge will wear at a rate similar to that of the adjacent teeth, preservation of identical occlusal contacts, cost effectiveness, convenient single-visit treatment, and a positive emotional and social response from the patient.⁹⁻¹¹

The fractured fragment can be used even if the fracture is complicated but the most important criterion in restoring such teeth is margins should be accessible. Gingivectomy can be done if the fracture margin is slightly at subgingival level. Isolation is the key to success in such cases. Rubber dam was not possible in every case of fragment reattachment, but adequate isolation was achieved using cotton rolls, cheek retractor, and gelfoam.

Self-adhesive cements were used to lute the post to the canal. Radovic et al have reported that the adhesion between the post and the root canal walls showed better adhesion to root canal dentin with self-adhesive cement.¹² Debonding and root fracture are the most common complication of post and core system.¹³ The rigid cast metal post causes wedging forces on the teeth and may

cause root fracture of the already weakened tooth because of fracture but the fiber post has demonstrated negligible fracture.^{8,14,15} Reduction of tooth fractures occurs when fiber post are used because it uses minimum preparation during placement and uses the undercuts and surface irregularities to increase the surface area for bonding.^{2,16}

In this case, internal groove was placed in the teeth which provided a better strength recovery than simple reattachment. Wiegand et al suggest the use of an internal groove when the residual dental structure and the fragment fit perfectly.¹⁷ Reis et al have reported that placing internal groove recovered 90.5% of fracture resistance of intact tooth.¹⁸ But parafunctional habits may cause reattachment failures, so fabrication of a mouth guard and patient education about treatment limitations enhance the clinical success.¹⁹

In all cases of traumatic injuries, follow-up is of critical importance. The patient should be followed for 3, 6, 12 months, and yearly for 5 years.²⁰ Esthetics, tooth mobility, and periodontal status should be confirmed both clinically and radiographically at these follow-up visits.

CONCLUSION

Tooth fragment reattachment procedure offers an ultra-conservative, safe, fast, and esthetically pleasing result when the fractured fragment is available. The use of natural tooth substance clearly eliminated problems of differential wear of restorative material, unmatched shades, and difficulty of contour and texture reproduction associated with other restorative techniques.

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